

CLAIMS

Having thus described the preferred embodiments, the invention is now claimed to be:

5 1. A loudspeaker assembly, comprising:
 an enclosure defining a speaker cavity;
 at least one speaker mounted to said enclosure;
 said enclosure having an opening formed in a surface thereof and a
 reflex tube extending from said opening into said speaker cavity, said opening
10 and reflex tube defining a passageway for air movement in response to speaker
 movement;

 a combined heat sink and amplifier mounting bracket secured to
 said reflex tube, said combined heat sink and amplifier mounting bracket
 including an amplifier mounting portion and a thermally conductive heat sink
15 portion, said thermally conductive heat sink portion aligned with said reflex tube
 such that air moved in response to speaker movement passes over said heat
 sink portion.

 2. The loudspeaker assembly of claim 1, further comprising:
20 an amplifier mounted to said amplifier mounting portion and
 thermally coupled to said thermally conductive heat sink portion.

 3. The loudspeaker assembly of claim 1, wherein said heat sink
 portion includes a thermally conductive plate member and a plurality of thermally
25 conductive fins extending from in thermal communication with said thermally
 conductive plate member.

 4. The loudspeaker assembly of claim 3, wherein said plate
 member and said fins are integrally formed of a thermally conductive material.

5. The loudspeaker assembly of claim 3, further comprising:
an amplifier mounted to said amplifier mounting portion; and
said amplifier including a heat-producing component, the heat-
producing component thermally coupled to said thermally conductive plate
5 member.

6. The loudspeaker assembly of claim 5, wherein said amplifier
includes a circuit board and a power amplifier semiconductor device electrically
coupled to said circuit board.

10

7. The loudspeaker of claim 6, further comprising one or both
of:

at least one fastener for attaching said circuit board to said amplifier
mounting portion; and

15 at least one fastener for maintaining thermal communication
between said power amplifier semiconductor device and said conductive plate
member.

8. A combined heat sink and mounting bracket for a powered
20 loudspeaker of a type having an enclosure, a reflex port formed on the enclosure,
the reflex port defined by an opening on a surface of the enclosure and a tube
extending from the opening into an interior of the enclosure, the combined heat
sink and mounting bracket comprising:

a base portion;

25 a fastener attached to the base portion for securing the combined
heat sink and mounting bracket to said tube; and

a thermally conductive heat sink portion extending from the base
portion.



9. The combined heat sink and mounting bracket of claim 8, further comprising:

one or more openings formed in the base portion for mounting a circuit board carrying an amplifier circuit.

5

10. The combined heat sink and mounting bracket of claim 8, further comprising:

one or more openings formed in heat sink portion for affixing an amplifier in thermal communication with said thermally conductive heat sink portion.

10

11. The combined heat sink and mounting bracket of claim 8, wherein said heat sink portion includes a thermally conductive plate member and a plurality of thermally conductive fins extending from in thermal communication with said thermally conductive plate member.

15

12. The combined heat sink and mounting bracket of claim 11, wherein said plate member and said fins are integrally formed of a thermally conductive material.

20

13. The combined heat sink and mounting bracket of claim 11, wherein said base portion, fastener, plate member, and fins are integrally formed of a thermally conductive material.

25

14. The combined heat sink and mounting bracket of claim 13, wherein said thermally conductive material is a sheet of material formed of a metal or metal alloy.

15. The combined heat sink and mounting bracket of claim 13, wherein the thermally conductive material is selected from the group consisting

30

of aluminum, aluminum alloys, copper, copper alloys, zinc, zinc alloys, beryllium, beryllium alloys, brass, and stainless steel.

16. A combined heat sink and amplifier module for a powered
5 loudspeaker of a type having an enclosure, a reflex port formed on the enclosure, the reflex port defined by an opening on a surface of the enclosure and a tube extending from the opening into an interior of the enclosure, the combined heat sink and mounting bracket comprising:

a base portion;

10 a fastener attached to the base portion for securing the combined heat sink and mounting bracket to said tube;

a thermally conductive heat sink portion extending from the base portion;

an amplifier mounted to the base portion; and

15 said amplifier including a heat-producing component, the heat-producing component thermally coupled to said thermally conductive heat sink portion.

17. The combined heat sink and amplifier module of claim 16,
20 wherein said amplifier includes a circuit board and a power amplifier semiconductor device electrically coupled to said circuit board.

18. The combined heat sink and amplifier module of claim 17, further comprising one or both of:

25 at least one fastener for attaching said circuit board to said amplifier mounting portion; and

at least one fastener for maintaining thermal contact between said power amplifier semiconductor device and said conductive heat sink portion.

19. The combined heat sink and amplifier module of claim 17, further comprising a thermal compound disposed between said heat-producing component and said thermally conductive heat sink portion.

- 5 20. A method for improving heat dissipation from an amplifier in a powered loudspeaker device, the loudspeaker device of a type having an enclosure defining a speaker cavity, at least one speaker mounted to said enclosure, said enclosure having an opening formed in a surface thereof and a reflex tube extending from said opening into said speaker cavity, said opening and reflex tube defining a passageway for air movement in response to speaker movement, the method comprising:
- 10 positioning a combined heat sink and mounting bracket in said speaker cavity in alignment with said reflex tube;
- securing the combined heat sink and mounting bracket to said tube;
- 15 mounting an amplifier to said combined heat sink and mounting bracket, said amplifier electrically coupled to said speaker;
- thermally coupling a heat producing component of said amplifier to a heat sink portion of said combined heat sink and mounting bracket;
- operating said amplifier to drive said speaker, wherein heat
- 20 generated by said amplifier is transferred to said heat sink portion and wherein air movement through said reflex port exerts a cooling effect on said heat sink.